

3. A lens according to claim 2 including a flexible hollow spacer along the periphery of the membranes for forming a seal for the refractive fluid in said volume, a secondary and independent fluid filling the hollow in said spacer, and means for selectively changing the pressure and volume of said secondary fluid for changing the optical of the lens.

4. A lens according to claim 1 wherein one of the membranes has a thickness that varies such that during changes in pressure of the refractive fluid, the displacement of said one of the membranes defines a spherical surface so that the focal lens changes without distortions.

5. A lens according to claim 1 in which the frame includes segments individually and independently operable for changing the pressure of said fluid.

6. A lens according to claim 5 wherein one of said membranes is rigid.

7. A lens according to claim 2 wherein an average "resting" pressure inside the lens defines a resting state wherein control pressure variations are positive or negative with respect to that state during variations in said pressure whereby aging of the flexible member by reason of repetitious deformations from its original shape are minimized.

8. A lens according to claim 3 including a conduit passing through said spacers and into said enclosed space without breaking the seal for allowing the transfer of refractive fluid into and out of the enclosed space.

9. A lens according to claim 8 including a source of refractive fluid, and means for connecting said source to said enclosed space via said conduit for pressurizing fluid in said volume.

10. A lens according to claim 1 wherein the fluid is a gas.

11. A lens according to claim 1 wherein the material of said membranes is sufficiently transparent and has suitable refractive properties, for light of the type including visible light, infrared light, and combinations thereof.

12. A lens according to claim 1 including a servosystem, an automatic range finder, and a converter for converting signals from the range finder into pressure values which automatically regulate the focal length of the lens.

13. A lens according to claim 1 wherein said frame is constructed and arranged to produce forces on the periphery of each membrane which are uniform and perpendicular to the membrane.

14. A variable power lens comprising:

(a) a pair of optical membranes each of which has a periphery, and at least one of which if flexible, the peripheries being juxtaposed;

(b) frame means for holding said membranes with their peripheries in juxtaposition such that the surface of the membranes and their peripheries define a predetermined volume;

(c) a refractive fluid filling said volume; and

(d) control means operatively associated with said frame means for selectively imposing forces on the periphery of the membranes which vary the fluid pressure in said volume;

(e) said membranes and said frame means being constructed and arranged so that the surface of the flexible membrane varies in a substantially spherical manner in responsive to changes in pressure in the fluid.

15. A variable power lens according to claim 14 wherein said volume remains fixed when the pressure varies.

16. A variable power lens according to claim 15 wherein the spacing between the periphery of said membranes is variable.

17. A variable power lens according to claim 14 including a hollow gasket interposed between the periphery of the membranes, and control fluid filling said gasket for controlling the amount of fluid in said gasket thereby determining the peripheral spacing between the membranes.

18. A variable power lens according to claim 17 wherein said frame means includes an auxiliary hollow gasket interposed between the periphery of one of the lenses and the frame means, said control fluid filling said auxiliary hollow gasket, and fluid control means for controlling the percentage of fluid in each hollow gasket.

19. A variable power lens according to claim 18 wherein said frame means is U-shaped with a pair of spaced legs for receiving the peripheries of said membranes, said auxiliary gasket being interposed between one of the legs and one of the membranes.

20. A variable power lens according to claim 19 including a second auxiliary hollow gasket interposed between the other of the legs, and the other of the membranes, said control fluid filling said second auxiliary gasket, and fluid control means for proportioning said control fluid between the auxiliary gaskets and said hollow gasket.

21. A method for varying the power of a lens of the type having juxtaposed optical membranes, at least one of which is flexible, and which are sealed at their peripheries to define an enclosed volume containing a refractive fluid, said method comprising the steps of: pressurizing the refractive fluid, and clamping the peripheral edges of the membranes such that the pressure of the fluid is responsive to forces and/or torques applied to the peripheral edges of the membrane, and incremental changes of curvature of a region of the surface of the flexible membrane, in response to changes in pressure of the fluid, follows a spherical law.

22. A variable power lens comprising:

(a) a pair of optical membranes, each of which has a peripheral edge and a central surface, and at least one of which is flexible;

(b) sealing means for sealing the peripheral edges of the membranes and defining an enclosed volume between the surfaces of the membranes;

(c) a refractive fluid filling said volume;

(d) frame means for gripping the peripheral edges of the membranes and imposing forces and torques on said edges; and

(e) means associated with the frame for controlling the forces and torques on the peripheral edges of the membranes, the pressure of the fluid in said volume being responsive to said forces and torques.

23. A variable power lens according to claim 22 wherein said means for selectively pressurizing the fluid in said volume includes means for changing the spacing between the peripheral edges of the membranes.

24. A variable power lens according to claim 22 wherein said frame means is constructed and arranged so that the distribution of forces imposed on the edges by the frame member is non-uniform around the periphery of the membranes.

25. A variable power lens according to claim 1 wherein said at least one of the membranes has a reflective coating to form a mirror with a variable focus.

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